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Area of research

- Psychophysiology of emotion, personality, psychopathology
 - Anxiety and autonomic nervous system (ANS) activity
 - Cardiac vagal (parasympathetic) control via heart rate variability (HRV) analysis
- Theoretical foundations:
 - Neurophysiological models of anxiety and defensive responding
 - HRV as an index of central-ANS integration in the service of emotion regulation & social engagement
 - *Autonomic flexibility*
 - *Neurovisceral integration*
 - *Polyvagal theory*
 - *Functional psychopathology*
- Anxiety & autism spectrum disorders
 - Impaired social interactions
 - Extreme anxiety in response to change

Findings

- **Prediction:** Low cardiac vagal control in anxiety, as indicated by a variety of HRV measures
 - **Supported:** Reduced *respiratory sinus arrhythmia* (RSA; rMSSD, HF ECG spectral power) in:
 - **Panic disorder** (Friedman et al, 1993; Friedman & Thayer, 1998a)
 - **Generalized anxiety disorder** (Thayer, Friedman, & Borkovec, 1996; Thayer, Friedman, et al. 2000)
 - **Elevated HR in high worry women** (Knepp & Friedman, 2008)
 - **Consistent findings across various forms of anxiety** (state, trait, pathological; Friedman & Thayer, 1998b; Friedman, 2007)
 - **RSA correlated with various measures of pro-social behavior in children with autism** (Patriquin, Scarpa, Friedman, & Porges, 2012)
 - **Supportive findings on defensive responding in autism** (Patriquin, Scarpa, Friedman, & Porges, under review)

Ways my research can contribute to the mission of CAR (multidisciplinary autism research)

- Psychophysiological approach: Non-invasive assessment of autonomic activity in autism
 - ECG—HR & HRV analysis
 - *Impedance cardiography*: sympathetic cardiac activity
 - *Electrodermal activity*: global sympathetic activation
 - *Hemodynamic activity*: blood pressure
- Variety of experimental paradigms:
 - Laboratory-based ANS assessment under a broad range of conditions
 - Emotion induction (films, music)
- Integrate theoretical perspectives (e.g., autonomic flexibility) with approaches from other disciplines

Current working relationships & available resources

- Ongoing collaboration:
 - Angela Scarpa, VT Autism clinic
 - Susan White, VT Autism clinic
 - Michelle Patriquin, Dept. of Psychology
 - Ken Kishida, VTCRI
 - Stephen Porges, Research Triangle Institute
 - Publications: 1 journal article, 1 book chapter (in press); 1 paper under review
 - Submitted R21 revision
 - Autism symposium at the upcoming meeting of the Society for Psychophysiological Research (Sept. 2012)
 - Mind-Body Lab: 253 WMS Hall; fully equipped psychophysiology lab, three graduate students

Collaborations/resources needed to make multidisciplinary research program possible

- Current/future directions
 - Access to affected clinical samples
 - Clinical intervention studies
 - Brain imaging technology
 - Neural economics
 - Open to new ideas!